Autumn Sunrise in a Louisiana Marsh — *E. M. Schiwetz*

The Humble Way

NOVEMBER-DECEMBER, 1957

JASPER ARTHUR NEATH: 1896-1957

Director, 1942-1947
Vice President and Director, 1947-1955
Chairman of the Board, 1955-1957

The Humble Way

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Vol. XIII No. 4

J. A. NEATH

A Resolution Adopted by the Boards of Directors of the Humble Companies:

On November 16, 1957, death came to Jasper Arthur Neath, Chairman of the Board of Directors of Humble Oil & Refining Company.

In almost forty years of service with the Humble companies, he contributed greatly to the progress of these organizations. Beginning with his early work in the field, he displayed the ability, energy, and integrity of character which led him to high executive offices in both Humble Pipe Line Company and Humble Oil & Refining Company. He was a dynamic, forceful but fair-minded leader and, at the same time, a considerate and thoughtful person. He was highly regarded as a personal friend and adviser by his fellow employees and business associates both inside and outside the company.

Jap, as he was known affectionately by his friends, did much to establish good will, mutual understanding and confidence between all segments of the petroleum industry, large and small. He was active in many industry organizations in which his advice and counsel were eagerly sought and widely respected.

In local and state activities of civic, religious, educational, and charitable nature, he participated effectively. He gave of his means, his time, and his energy in organized programs and campaigns designed for the common good.

In recognition of the profound influence he had on the progress of the Humble companies, of his qualities of leadership and character, of his helpfulness to fellow employees, friends and associates, and as an expression of personal appreciation, the Board directs that this resolution shall be spread upon its minutes this the 19th day of November, 1957, and a copy be sent to his devoted family with assurances of deepest sympathy.

Board Chairman J. A. Neath leaves the Humble Building with brief case in hand to attend a civic or industry meeting. This is how many employees and industry friends remember him.

A LIFE OF SERVICE

THE story of J. A. Neath's life is closely interwoven with that of the Humble Companies and the oil industry which he served so long and so well. For 39 years his devoted efforts were a contributing force in Humble's growth and development, and in the progress of the industry.

A native of Red Rock, Pennsylvania, Mr. Neath was attracted to the oil industry while still a teen-age youth. His first job was as member of a connection crew for Texas Pipe Line Company. Later he worked for Gulf Pipe Line Company and Southern Pipe Line Company. When the latter became a part of the infant Humble Pipe Line Company in 1918, Mr. Neath became a Humble employee. He was district foreman at Ranger, 23 years old, and already an experienced pipeliner.

Five years later, after serving with distinction as superintendent of the important Cisco division, he was transferred to Houston to become general superintendent of Humble's entire pipeline system.

In 1925 Mr. Neath was elected a director of Humble Pipe Line Company, and three years later he became a vice president.

It was during this busy period of growth and expansion that Mr. Neath established many of the lifelong personal friendships he enjoyed throughout the industry. As the Company's pipeline system was extended into many new fields, it also served more and more producers other than Humble. Mr. Neath had an important role in helping to carry out Humble's crude oil purchasing policy, the fairness of which has long been recognized by all segments of the oil industry.

In 1942, Mr. Neath became a director of Humble Oil & Refining Company. He was elected a vice president in 1947. His executive responsibilities included the Purchasing Department, Crude Oil Department, Marine Department, Traffic Bureau, office buildings, public relations, and coordination of affairs with Humble Pipe Line Company.

When L. T. Barrow retired as Chairman of the Board in 1955, Mr. Neath was elected to succeed him. In the words of then-President Hines H. Baker, "his wide acquaintance with the Company's business, his experience in all phases of industry problems, his contacts on the outside, and wide acceptance in the industry and outside the industry, make him a fortunate choice for this position."

In addition to his exacting duties of leadership in the business world, Mr. Neath was active in civic, church, and educational affairs for many years. He served as a director and member of the executive committee of the Houston Chamber of Commerce, a member of the board of directors of St. Luke's Episcopal Hospital, and a vestryman of Christ Church Cathedral. He was chairman of the 1947 Community Chest drive in Houston, and took part in other civic and church projects. He headed the drive to raise funds for construction of the present St. Thomas High School building.

In 1951 Mr. Neath was presented the Texas Mid-Continent Oil and Gas Association's Distinguished Service Award for his meritorious service to the industry.

In a letter to employees, occasioned by the death of Mr. Neath, Humble Oil & Refining Company President Morgan J. Davis and Humble Pipe Line Company President A. E. Pecore concluded:

"We shall always remember with grateful appreciation the many contributions of this remarkable leader to our companies, to the industry, and to the community. We cannot replace him, but we can and will seek to follow the high standards and good example he set for all of us."

INDUSTRY'S ROLE IN COMMUNITY HEALTH

By H. W. Ferguson . . . *Vice President, Humble Oil & Refining Company*

INDUSTRIAL health, we are learning more and more, cannot be confined to the four walls of any business. It is inseparably bound up with community health. Improved industrial health inevitably leads to improved community health.

There is a good reason for such a direct relationship. Industry is part and parcel of every community, and what occurs in one element of daily life in a local area must very definitely affect other elements.

Therefore, American business needs to understand better the close relationship between industrial medicine and community health. The environment in which a worker lives is fully as important as the environment in which he works. He is in the plant eight hours a day, but he is outside the plant twice that long.

Essentially, it comes to this: if the partnership between medicine and industry is to realize its full potential, it must make itself felt in the community, in the ranks of medical societies, in the halls of the health department, and in the councils of civic leadership.

Enlightened management sees good health as good business. It sees the promotion of employee and community health as a vital part of its activities. It recognizes the promotion of in-plant medicine and industrial health as a part of a broader task of building a healthy environment—physical, mental, and social—for greater productivity.

This is a real dollars-and-cents proposition. Sickness costs workers themselves billions of dollars a year in wages. It causes companies to lose about a half billion man-days of work annually. And the country, which counts a healthy working force as a precious resource, gets thrown for a loss in vital production. Broken down and localized, these tremendous national losses are nothing but the sum of community losses. In that light, we have a clear course to follow in bringing about closer and better relationships between industrial health and community health.

Just as each private citizen should contribute in some way to the growth of his community, each industry should encourage and support those activities and programs which have a place in the overall improvement of the community. The corporation that is a good citizen will not neglect the challenging opportunity to lead out in the sphere of community health.

Industry can and should assist in community health by:

1. Recognizing and fulfilling its responsibility to its own employees. To do this, a corporation needs a competent, adequately staffed, and fully equipped medical division. It is also important to develop a strong and workable medical policy to embrace curative, preventive, constructive, and educative medicine.
2. Practicing industrial hygiene by detecting and preventing hazardous environmental conditions and promoting safe working areas.
3. Cooperating with local, state, and national allies on the medical front.
4. Supporting medical resources in the community, including the private practitioner.
5. Promoting in-plant and community health education.

"There is no fence high enough to keep disease

Logically and properly, the first concern of a medical division should be the health of employees. If industry does not first fulfill its responsibility to employees, it can hardly be expected to figure prominently or accomplish much in the field of community health. Health, like charity, should begin at home. And, in carrying out its functions, a medical division must not only control the disease factors which affect the employee's health; it must also do all it can to protect the worker against environmental conditions that might be injurious. This brings us to the field of industrial hygiene.

Industrial hygiene is a marriage of medicine and engineering to prevent occupational ills. It is a broad field dealing with problems of industrial poisons and dust; ventilation, temperature, and humidity; light, radiation, noise, and nuisances; cleanliness, sanitation, overcrowding, hours of labor, rest periods, and fatigue; child labor; women in industry; workman's compensation; communicable diseases, mental health, and personal hygiene. In short, industrial hygiene helps keep the worker on the job, and in good health.

Preventive medicine is the backbone of industrial health

Quite often, the industrial hygienist helps with the solution of health problems on a community level, as well as on the in-plant basis. Here, as well as inside the plant, his contributions are measured not by headlines, but by the absence of headlines. His efforts are, and should be, concerned primarily with preventive medicine.

Preventive medicine is not new, by any means. It has been, and continues to be, the backbone of industrial medicine and hygiene. Under the somewhat newer term of constructive medicine, it offers a broad medical-psychological program as a solution of the problem of how to keep the employee happy and working.

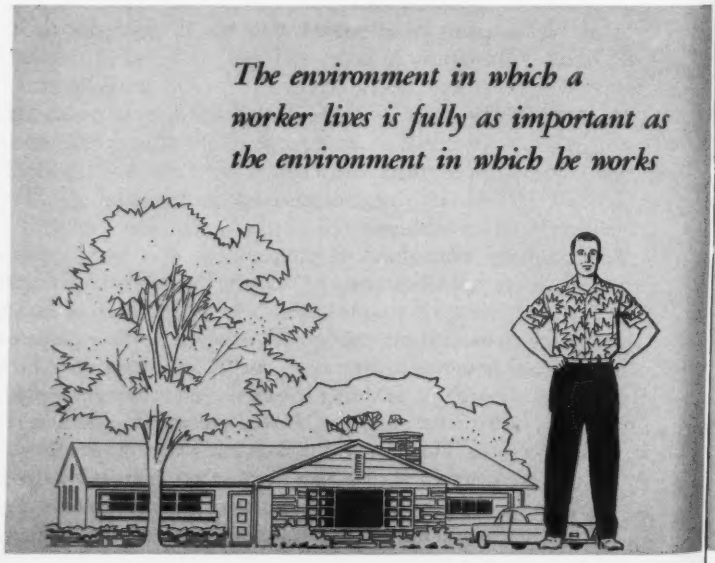
In this work, as in other duties, the doctor in industry happens to be in a unique position in dealing with people. He should know his medicine and be a good listener when an employee comes to him with a problem. He has to be an intermediate between worker and management. In a sense, the doctor in industry corresponds to the prototype of the old-time country doctor. For, like the physician of the horse-and-buggy era, he is concerned with the "whole health" of the individual—mental, physical, and social.

This whole health concept becomes nearer a reality when an alert management will encourage its industrial physicians and staff to establish close relations with their natural allies. Among them are health officers, practicing physicians and nurses, medical societies, voluntary health agencies, medical schools, hospitals, and other agencies interested in community health.

Family doctor should have wholehearted support of industry

Working together, these groups can discover and solve health problems which, if unsolved, would erode away at the foundations of the best in-plant health programs. Unknown gaps in community health protection—affecting the health of employees and their families—can by joint inquiry be exposed and eliminated.

Since the private practitioner is the cornerstone of community health, he deserves and should get the wholehearted support of industry. Every employee should be encouraged to have a family



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Industry has many ways to participate in health education

Industry has another role to play in employee and community health—that of health education. The educational approach helps employees understand the importance of good health and stimulates in them a desire to improve their own health practices.

A civic-minded corporation also participates in health education *outside* the plant. Encouragement of employees to see health films and hear talks, and the cooperation with voluntary health groups in presenting their programs are but a few of the many efforts which demonstrate industry cooperating with the community.

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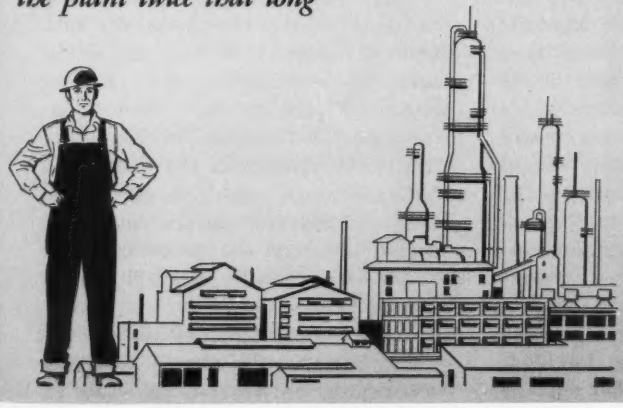

Industrial medicine has come a long way. Its stature is quite remarkable when you consider that 60 years ago, only a few believed that poor health and absenteeism could be forestalled by giving people medical care on the job. And the pace of progress in this important work seems to quicken with each passing year. Today, industry is spending at least three times as much on its employees' health as it did in 1940.

Granted, then, industrial medicine has come a long way since the days of the cigar-box first aid station. But where is it headed? And how may its work be expected to bring about still greater benefits to communities in which industry operates?

First of all, I believe we are moving toward more teamwork between industrial medicine and corporation management. Industry gravely needs the help and guidance that a medical staff is uniquely qualified to give. That applies to the full use of medical techniques and tools within the plant as well as to company participation in the promotion of community health.

We must look far beyond the plant gate or office door

I believe we will more completely overcome the lag between new developments in medicine and their application to industrial health. Successful and well-rounded medical programs for in-plant use must be geared to medical research, to take full and immediate advantage of all new tools and weapons. I believe, too, that we are moving in the direction of better mental health in industry and related matters which should prove most useful in the areas of employment, job placement, productivity, and retirement. Again, what may be done to help employees in these matters will benefit the communities in which they live.

There is no fence high enough to keep disease and poor health out of business and industry. Concern for employee health must extend beyond the eight hours a day that workers spend on their jobs. To attain and maintain good health for employees, we must broaden our interests. We must look far beyond the plant gate or the office door. And when we do, we will become more firmly convinced that industry can and must play an ever-increasing role in the betterment of community health.

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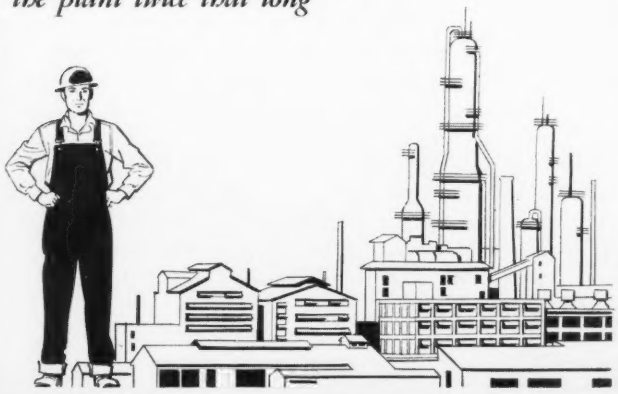

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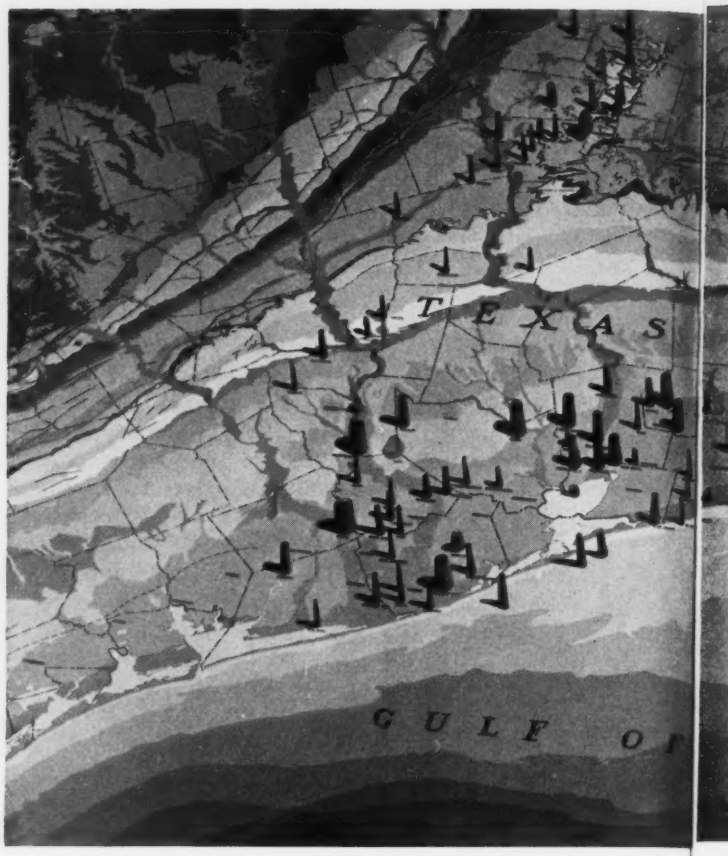


Peg map of salt plugs in Gulf Coast area gives X-ray view of earth's first 20,000 subsurface feet. Productive salt dome province extends from South Texas to Alabama.

THOSE AMAZING SALT DOMES

On land and in the sea, these mysterious intruders from the deep have proven a friend to the oil man

IF, like an angry giant, you could get your fingernails under the south central edge of the United States, rip off a 20,000-foot layer and then stand back in the Gulf of Mexico to admire your handiwork, you would behold a coastal tableland dotted, very much like the model above, with salt domes.

Standing like subterranean monuments to Mother Earth's eccentricity, these strangely shaped pillars of solid salt have been friendly to the U. S. oil man since the tenth day of this century—the day the Spindletop gusher came in atop a salt column near Beaumont to give birth to the modern oil industry. Salt dome fields account for roughly one-half the crude oil that has made Humble the country's largest domestic producer.

These intruders from the depths are generally known and welcomed on four continents—in Mexico, Germany, France, Rumania, Poland, Russia, Algeria, Egypt, and Persia. The two important salt dome provinces on the North American Continent are the Gulf Coast of Texas, Louisiana, and Mississippi; and the Isthmus of Tehuantepec in Mexico.

Happily, the salt dome seems to be most at home in the Gulf Coast area, where more than 250 are known to exist—126 in Louisiana, 83 in Texas, 52 in Mississippi, and three in Alabama. Clusters of them have been found under rolling, grassy prairies, steaming swamps, and more recently, under the shallow waters of the Gulf. One, the Pierce Junction dome, sits majestically beneath the Houston city dump.

As the saline keystone in the arch of Gulf Coast geology, the salt dome is one of the big reasons for big industrial doings in the Golden Crescent. This productive province stretches in a half-moon almost 700 miles from French-flavored New Orleans to Brownsville, next door to Mexico. Its 50,000-square-mile swath cuts across areas rich in rice, cattle, shrimp, oysters, sulphur, salt, and traditions—not to mention oil and gas.

Some who do mention oil and gas calculate you can close your eyes, stick a pin anywhere in the map, and almost surely be doused by a gusher of oil or blown off your feet by a blast of natural gas. That's absurd, of course. But the 1,000 oil fields of the Gulf Coast embrace about one-third of the nation's oil and gas reserves. And a big slice of the credit goes to the salt dome —one for every 40 square miles in the coastal flatlands.

Aside from trapping oil and gas, salt domes are the chief source of sulphur and, quite naturally, salt—two re-

sources that rank high on the mineral social register. A few triple-threat domes—Jefferson Island and Sulphur in Louisiana; Bryan Mound in Texas —have produced sulphur, salt, *and* oil. As visitors to a region of soft sediments, salt domes also provide limestone and gypsum. Too, their salt is easily washed out to form storage cavities for liquefied petroleum gas. The dome cap rock and super cap clays and shales provide a safe and leak-proof bottle cap.

By strict definition, a salt dome isn't all salt. It includes (1) the bluish-gray salt plug—often and carelessly called the dome, (2) the cap rock, (3) the false cap of lime-cemented sand and shale, (4) sands, clays, and shales domed above the cap rock. (5) the flanking sands and shales dipping away on the side of the plug and, at great depth in some cases, (6) a shale sheath or "gouge" zone of crushed sediments adjacent to the salt.

If you've never seen a salt dome along the Gulf Coast, shake hands with the fraternity of geologists, who never have either—except from the inside of a salt mine. Some of the salt columns, however, have pushed so near the surface that they form visible mounds of the overlying sediment. One such mound, only 15 feet high, is formed by the upward thrust of the Spindletop dome. But the highest salt dome structure in the Gulf Coast country is Davis Hill, which rises 170 feet above the surrounding plain. Avery Island, the second highest, sticks up 152 feet from the swamps as a geologic sore thumb.

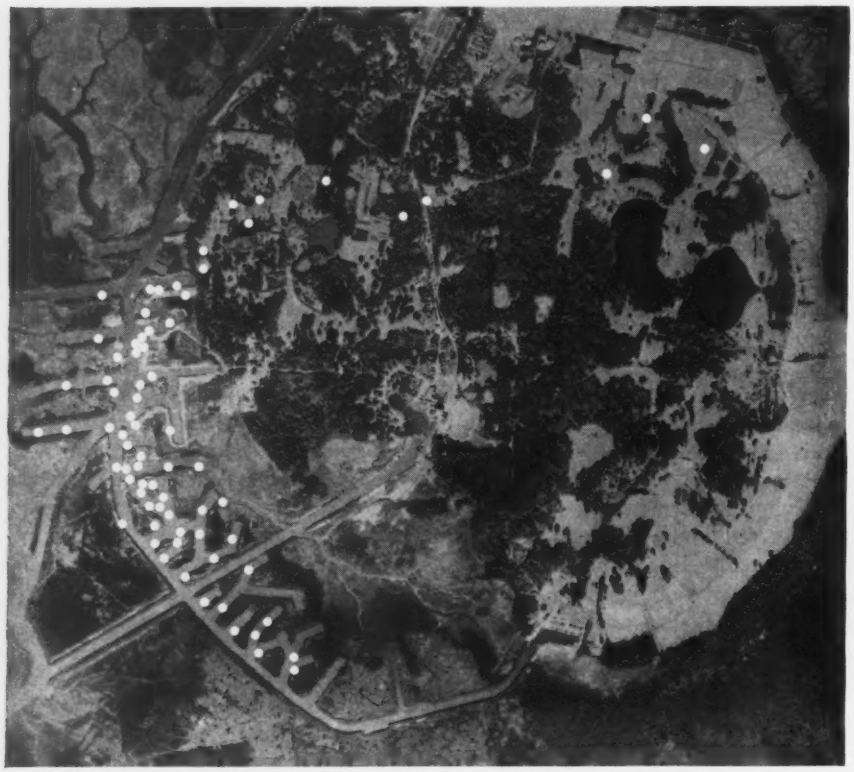
Size-wise, salt domes range in width from a few thousand feet to several miles. Boling, probably the biggest inland dome, is six miles across at its widest point. As for depth, nobody knows: drills have penetrated only to 22,570 feet. The well which delved to that record depth produces oil and gas from the flanks of the Lake Washington dome in Louisiana (Humble is not the producer, but is one of several royalty owners.) By contrast, oil is pumped from only 400 feet in the cap rock of the Boling dome.

Most of these salt masses are outlined as blunt plugs or gently tapering spines. Others, like Hockley near Houston, resemble mushrooms. Millican dome is an arrowhead pointed skyward. East and West Hackberry are believed to join in the depths, forming the only known double dome.

Just how do salt domes get that way? Most geologists believe they rise more than 30,000 feet from what is affectionately called the "mother" salt. There are several theories as to just how this happened. One popular theory has it that a great while ago—say 150 to 200 million years—the beds were built up by eons of evaporation in ancient seas. This process is going on daily—on a much smaller scale—in the Great Salt Lake of Utah. Considering the size of her Gulf Coast family, the mother bed of salt is probably upwards of 1,000 feet thick, comparable to beds in the great Permian salt basin of West Texas, New Mexico, Oklahoma, and Kansas.

Through the ages, layers of shale and sand were pancaked atop the salt and, eventually, this great weight forced the lighter salt upwards in a line of least resistance through the overlying strata—much as putty extrudes be-

Spindletop dome in cross-section illustrates two major phases of salt dome geology. First oil production came from cap rock in 1901; second discovery was flank production in 1926.



Avery Island is link in "Five Islands" salt dome chain in Louisiana swamps. Oil hunt began here in 1898, but Humble got first real production in 1942. Dots mark wells producing now.

tween your fingers when you press down hard on a lump of it with your hand. This plastic flow of salt can actually be seen today in Persia, where it emerges from the mountains looking like a glacier and moving much like molten lava.

That's the intrusive theory; but there are many others, each with variations. Some claim the salt originates from salt springs. As late as October of this year, a prominent geologist published a new twist on a volcanic origin theory dating back to 1860.

Oil men aren't as curious about salt dome origin as they are about how and where the masses trap petroleum. In the oil business, the trap's the thing. And of the several types of traps—anticlines, domes, stratigraphic traps, faults, etc.—the salt dome is king in the Gulf Coast region.

These curiously plastic salt cores shattered, cracked, squeezed, contorted, and bulged up the young strata in their vertical march. Therefore, salt domes offer a kaleidoscopic variety of nooks and crannies to imprison oil, often independent of those a few feet away. Domes where the salt pierces through the producing formations are known as piercement domes; those where the plugs stopped at great depths are called deep-seated. Oil and gas commonly are found in sands around piercement domes where the strata have been dragged upward by the salt and in the arched beds over the salt in the deep-seated domes. The domes at Humble, West Columbia, and Avery Island oil fields are classed as piercement; the domes at Conroe and Friendswood fields are deep-seated.

The history and development of the Humble Company is tied up closely with the salt dome. Since the early days, Humble geologists have been highly skilled at locating these prolific phenomena. This isn't surprising when you consider the salt dome is virtually under the Company's office windows. In searching for salt domes, pioneer oil finders for the Humble Company, like those of the whole industry, first used surface indications, then subsurface geology and finally, geophysics, a productive marriage of geology and physics.

Early drillers pulled the handle and hoped for the jackpot but with geology and geophysics, science got on the payroll. In the Gulf Coast, it got there

when no more salt domes could be found by obvious clues like mounds or depressions, or sour gas and sour water springs.

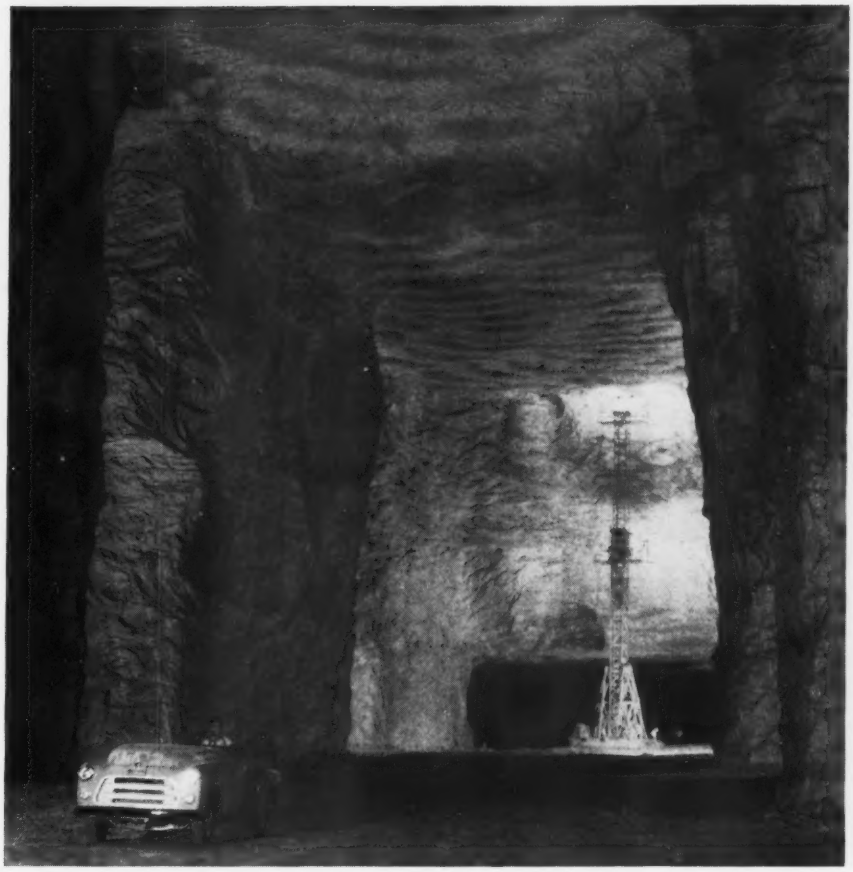
The first really scientific oil-finding tool was the temperamental torsion balance—the granddaddy to today's gravity instruments—used in European laboratories since the 18th century. Humble ordered two of them from Hungary in 1925 after Nash and Orchard domes in Brazoria County were successfully outlined by another company. The torsion balance was used widely until 1935, but Humble's first geophysical discovery—Moss Bluff dome in 1926—was with refraction seismograph.

Refraction is ideally suited to pinpointing Gulf Coast piercement-type salt domes. Its success is due to the fact that seismic waves, created by explosives, pass through salt domes almost twice as fast as through the surrounding sands and shales (about 16,000 feet per second). Thus, domes are spotted by what geophysicists call "the fast shot." Fan shooting locates the dome more precisely. Reflection seismograph supplies information for detailed sub-surface mapping and traces the deep domes. The gravity meter, which measures increase or decrease in gravity pull, is another useful tool in locating the salt dome.

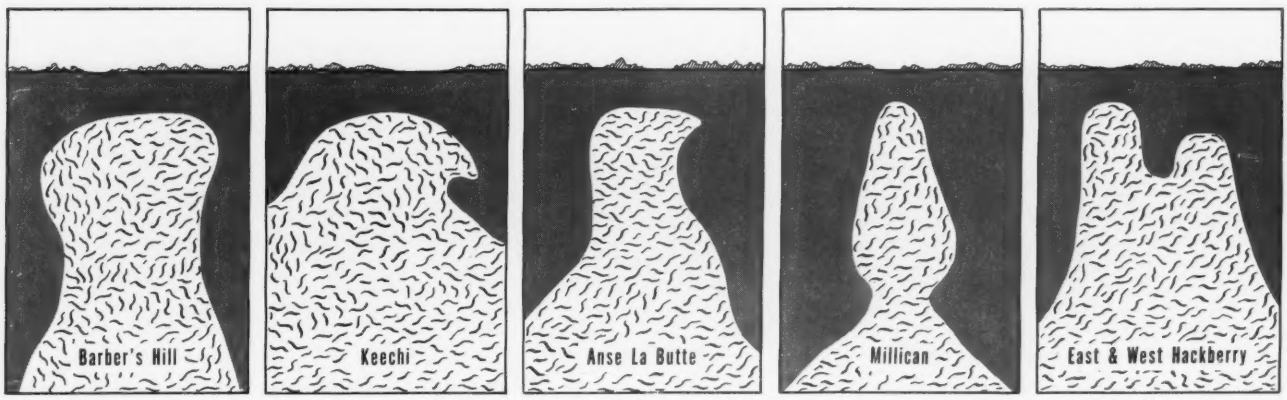
Even with the best of modern geophysical techniques and tools, the drill bit is the final arbiter. And salt dome drilling itself is no cinch. Take overhang, a structural deformity where the salt or its cap rock either leans or mushrooms out over the sediments, including the oil sands on the flanks of the dome. In the early days, many a pay was missed by stopping too soon in the salt. Another nemesis was subsidence, which in 1929 almost swallowed up Sour Lake oil field. Even today, dome anomalies are enough to induce a production geologist to feel like Daniel Boone, who was once asked if he had ever been lost. "No," he said, "but I was bewildered once for three days."

Oil reservoirs over and around salt domes take many shapes: snowshoe, half-moon, wishbone, teardrop, doughnut, and others. Where only a narrow strip around the dome produces, it takes some geologic wire-walking to avoid tumbling into dry territory. Offsetting a well on only 10-acre spacing, you may miss the pay zone completely.

First wells seldom hit paydirt. On Pierce Junction dome, the *57th well* in a block only three miles square found the oil. At West Columbia, the 41st attempt on a one-mile-square patch



Salt dome interior at Avery Island is honeycombed by mining of salt 99.5 per cent pure; cavern walls are 90 feet high. Car was dismantled, lowered 530 feet down shaft to mine floor.



Curious profiles of piercement domes show how plastic-like salt was contorted as it moved upward through sediments. Most, however, are blunt cores or tapering fingers. Barber's Hill, Keechi, Millican are Texas domes; Anse La Butte, East & West Hackberry are in Louisiana.

was the discovery well. Too, piercement salt dome production often declines more rapidly than other traps, since the reservoir may be cut by numerous faults. A pleasant exception is the 1904-vintage Humble dome, the all-time champion in overall piercement production. Other big producers for a half century or so are Spindletop, Big Hill, and Saratoga.

Some salt domes produce no oil at all, just as some oysters produce no pearls. But you're more likely to find oil around a random salt dome than a pearl in a random oyster. More than 90 per cent of lower Gulf Coast salt domes have produced oil, but many of those in East Texas and upper Louisiana and Mississippi have not—not yet, anyway. Many geologists contend that any dome worth its salt will eventually produce oil. When you find a salt dome, they say (remembering perhaps Lot's wife), never look back.

One man who has always had a great deal of faith in the future of the salt dome province is Wallace E. Pratt, retired vice president of both Humble and Standard Oil Company (New Jersey), and Humble's chief geologist during the race years to acquire salt dome leases. In his book, *Oil in the Earth*, Mr. Pratt wrote of the Gulf Coast oil region: "Most of our past production has come from it; and far into the future most of our exploratory activities will be devoted to it and most of our oil will continue to come from it."

The wisdom behind these words has held up strong over the almost 57 years since Spindletop—the first salt dome oil field—came in. Indeed, the salt dome domain seems to be expanding, both in terms of geography and oil-producing capacity. Just last August, a Humble crew drilled a dry hole in Alabama in what is one of the most easterly salt structures in the U. S. And with new and deeper drilling, salt domes both on the land and offshore may yield more oil than ever before.

In a phrase: If you're hunting oil, nothing beats salt dome country.

DOMES IN DAVY JONES' LOCKER

Humble geophysical crew prospects for oil in the Gulf of Mexico with reflection seismograph.

GIB MORGAN, that intrepid Paul Bunyan of the oil fields, told some pretty tall tales in his time—stories of drilling into reservoirs of rubber, buttermilk, champagne, quinine, even essence of peppermint. But Gib never spun fiction any more incredible than the fact that today oil is being hunted —and found—around salt domes in the Gulf of Mexico.

Tracking the fecund salt dome, oil sleuths moved from the dry land into the swamps and bays and inlets. It was inevitable that they would open the door to Davy Jones' locker as well. "No reason for the salt domes to stop simply because the Gulf begins," is the way one geologist sums up Humble's and 35 other companies' decision to move into the deep.

Such thinking was sound, if expensive to prove. Today there are 31 known domes in offshore Texas and Louisiana and nearly all of them have produced oil. Humble's production from six fields is only part of the industry's modest daily harvest of 103,000 barrels, but as marine techniques improve and rigs wade farther into the open Gulf, no doubt more domes and more oil will be found.

In 1948, Humble discovered at Grand Isle Block 16 salt dome the world's first offshore sulphur. This deposit, and the nearby one at Block 18 (ranked as one of the world's top five), were sub-leased to a sulphur mining company in September, 1956, for early development.

Offshore salt domes appear little different from those on the land. Most of those discovered so far are shallow piercement types: One, Rabbit Island, actually juts from the ocean floor when tides wash the silt from it. Some of them are enormous: Jumbo dome influences an estimated 50,000 acres of surrounding sediments and possibly is the biggest dome in the entire region, onshore or offshore.

Drilling offshore salt domes is not as new as you might think. The first one, Bay Marchand in Louisiana, was in 1928. The first real marine drilling off the Texas coast was ten years later—on Humble's McFadden Beach lease, in the Gulf of Mexico, near High Island. The water was only 18 feet deep, but with bad weather, high costs, and five dry holes, Humble pulled out.

A story about H. C. Wiess, Humble president 1937-48, illustrates the oil industry's attitude toward offshore drilling before World War II. Mr. Wiess visited one of the McFadden Beach wildcats on a day when the wind was up and whitecaps hammered at the platform. "Is this," he asked his associates, "the best place we've got to look for oil?"

Almost 20 years later, it still is not the *best* place. But it is a very good place. The salt domes are there. The oil should be, too.

A visitor to the Painted Rocks points out to his small daughter a pictograph shown in detail on Page 14. Just above and slightly to the left of the girl's head is a crude painting of a man. Some 1500 pictographs once adorned cliffs; many are now too dim to see.

PICTOGRAPHS AT PAINT ROCK

On cliffs near Paint Rock, in Concho County, Texas Indians once painted stories and sermons in stone to record their lives, times, and religions

TWO HUNDRED years ago, a Comanche brave stood before a smooth rock face overlooking the Concho River and began to enter an early-day "Texas brag" into the records of his people. Using slow strokes, giving soft limestone time to absorb red paint, the savage artist began to outline steeples and crosses of a Spanish mission which, but a short time ago, had flourished forty miles to the south.

Spaniards had called it Mission San Saba de la Santa Cruz. Comanches called it an intrusion and a threat. It took less than a day, in 1758, for the artist and his tribe to destroy the mission and its people. Now nothing but ashes remained.

That red symbol of victory over the white intruder, painted so long ago, still flames in beauty on the stone cliffs. And all around it, in a remarkable gallery of Indian art, gleam other pictographs, or picture writings, painted by nomadic tribes. At one time, according to a marker at the site, 1500 separate pieces adorned the face of the cliffs. Weather, time, and vandals have taken their toll. But enough still remains to make the north bank of the Concho as interesting an art center as the left bank of the Seine. From the pictographs the nearby town of Paint Rock takes its name.

Erupting suddenly from the earth, the rocky jumble of this outdoor exhibit runs along the river for a mile or so, then dips and disappears at one end as abruptly as it appears at the other. All along the way, unusual rock forms provided handy and well-proportioned canvases which almost cried aloud for paint. These were formed eons ago, when great forces in the

Spanish mission pictograph dates back to the middle 18th Century. Quite likely, it stands for Mission San Saba de la Santa Cruz, destroyed by Indians in this area in March of 1758.

earth splintered the stone into squares and rectangles which lie together in strange layers, much like the exposed ends of carelessly stacked lumber.

Some of the rock layers thrust forward from the rest and overhang a steep slope leading to mesquite-covered flats below. Under these stone roofs and back in the caves, Indians camped at this prehistoric motel during their nomadic wanderings. Here, too, they found food and shelter while on the war trail, but those who know the place best say the campsite itself was dedicated to the ways of peace and no blood was shed there.

Two questions about the pictographs intrigue scholar and casual visitor alike: How old are they, and what do they mean?

The first may be easier to answer than the second. Some paintings give their age away, within fairly narrow spreads of time, by their subject matter—as does the mission pictograph. One scholar on whose family's land the cliffs lie and who has earned distinction as a student of Indian lore, believes the patriarchs among the paintings still visible date back no farther than 300 years or so. Very dim pieces, or those underlying brighter and plainly more recent work, may antedate the coming of the white man. Some of the newest ones may not have passed their first hundredth birthday.

What a pictograph may mean sets up a puzzle more difficult to solve than its age. No Rosetta Stone exists, as it does for Egyptian hieroglyphics, to decipher meanings with precise accuracy. True, the simplicity of a few pictographs and the nature of their subjects leave little cause to doubt the artists' meaning. And certain others can be deciphered, with reasonable hope of accuracy, by logic combined with knowledge of Indians and their ways. But beyond that, the going gets rough. Even learned and dedicated scholars may disagree over the meanings of pictographs, especially those dealing with the spirit and the supernatural.

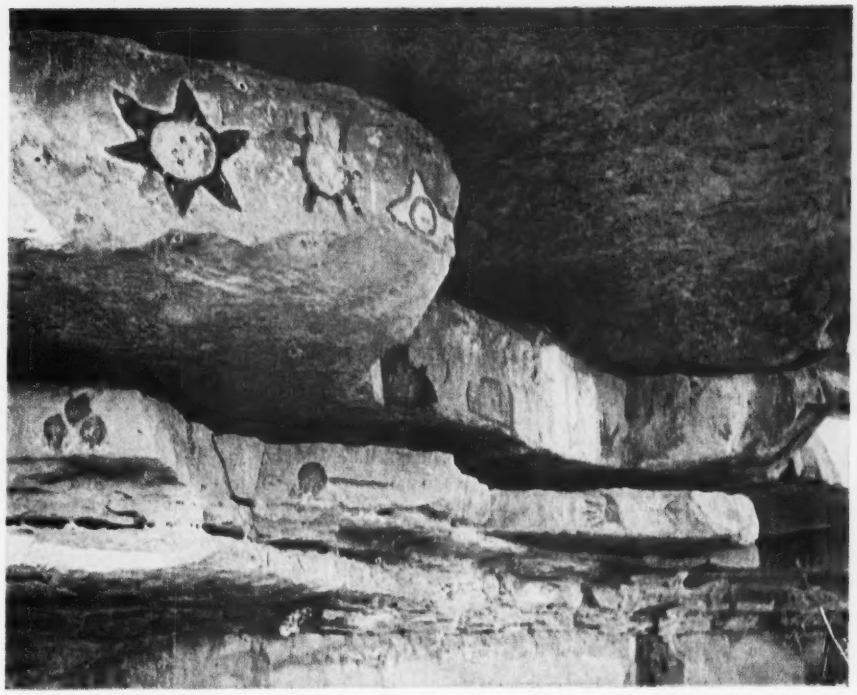
Among pictographs whose meanings are most transparent are those of birds and beasts, which presented life as the artist saw it around him, or may have served as totemic symbols. At one end of a jutting rock, a wild turkey painted in red stands out with such clarity and purity of line that its creator can claim fame as an ancient Audubon. At another spot an enraged buffalo, its tail upraised, paws the earth. Farther on, birds pass in perpetual flight across a stone sky. Here and there, hunting scenes underscore the Indian's basic concern for a full stomach.

Then come special story-telling pieces. Grouped closely at one point stand what most observers believe to be a stalk of corn, a grasshopper, and a shining sun. Here lies recorded the age-old struggle of growing things against insect invasion. An even more interesting sequence gives grisly details of an attack on a wagon train. To start the series, a hoopskirted captive lies prone. At her head, lances crossed over a shield tell a tale of deadly combat, while scalps dangling nearby bear tragic witness that some of the settlers never lived to enjoy the promised lands of the Great Plains.

Other paintings, more to a fighting man's taste, reveal much of the Indian's fierce struggle to keep his lands against mounting pressures of white migration. In warlike array along the cliffs, Army flags and guidons fly. Some share space with spears and bows, merging in mute narratives of some forgotten skirmish between cavalry and Indians.

Since it was not the way of the warrior to entrust his fame to his fellows or to history, many of the pictographs at Paint Rock take the form of "exploit pieces," or personal accounts of honors won. Near the far end of the rocks an outlined head, eagle feathers flying jauntily from it, clamors for attention. Each feather is a medal awarded for some daring coup or bit of bravery on the battlefield. Another monument to ego is the bright four-horned headdress strangely the same as a pictograph used as a signature by the Sioux chief, Four Horns, although Paint Rock is far from the old Sioux hunting grounds.

Hands, apparently, held more than casual interest for Indians; one finds a large number of hand paintings sprinkled among the rocks. Many are positive prints, made by wetting the palm with paint and pressing it to the



Stars painted at upper left show Indians' reverence for heavenly bodies. Farther to the right, on same rock face, is a red handprint. Device at lower center may be a war club.

stone. Others are outlines made by pressing a dry palm to the rock and blowing paint through a tube against the back of the hand and through outstretched fingers.

Some handprints may have been signatures or ego boosters, after the fashion of Hollywood stars who leave their prints in the soft cement outside Graumann's Chinese Theatre. But Herman Lehmann, a white boy captured in this general area before 1900, gives us another clue about the use of handprints in his book, *Nine Years Among the Indians.* According to Lehmann, the Indians he lived with had a crude system of counting on their fingers, like children before they master the multiplication table. Each finger, said he, stood for one unit and a full hand for the number five. But when the count reached 20, the symbol became a man. Thus, the number 25 would be indicated by a man and a hand.

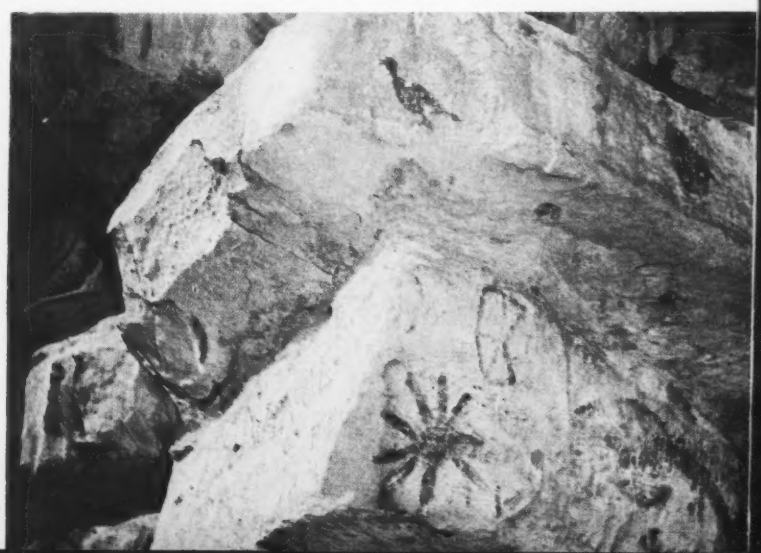
Another of Lehmann's stories tells how Indians used signs and symbols to convey messages. In 1875, somewhere near the Concho River, he left his tribe with a small raiding party. While returning to the main band, the raiders were discovered and attacked by Texas Rangers. Lehmann and a few fellow warriors escaped. Then, he says, "We went on to where we had left our people in camp, but when we reached there we found they had moved. We found buffalo bones and on them pictures representing a fight with the white people. On some bones properly arranged were the pictures of seven men pierced with arrows, also a wagon burning up; the bones pointed northward. Twelve bones peculiarly arranged represented twelve days' journey . . ."

Of the pictographs dealing with spirits and the supernatural, only one can be "read" easily—and it relates to the white man's religion, not to the Indian's. It is, quite literally, a well drawn little devil. In faded red and complete with horns, forked tail, and a pitchfork, it fits precisely our own traditional ideas about Satan. Possibly the artists who drew him had heard the Old Nick described in awesome details by someone exposed to missionary teachings.

Pictures of stars and suns scattered across the cliffs tell us what we already know—that Indians held these heavenly bodies in great reverence. But meanings of other spiritual subjects, unhappily, are not nearly so clear. There stands at one place high above the plain a winglike device with a circle in the center, said to be a symbol of immortality. According to

Lower pictograph is most likely an exploit piece showing feathers for honors won. Or possibly, some say, it is a cloud-rain symbol.

Wild turkey, top center, was once a masterpiece of Indian draftsmanship. Thoughtless vandals have marred its form and purity of line.



Story of an Indian attack begins with hoop-skirted woman at right. Reading left, note the shield and crossed lances, dangling scalps, and "strong medicine" of a turtle amulet, center.

one authority, a disturbingly similar device appears on a temple among ancient ruins in the Biblical land of Ur.

If there is an Indian holy-of-holies among the pictographs, it is the one which features an equal-armed cross enclosed in a circle. The Indian's preoccupation with the cross as a symbol goes far beyond idle bisecting of circles for the sake of symmetry. Indeed, there is evidence to show that Indians used this equal-armed cross before the coming of the white man and Christianity. Most men who study pictography agree that the cross was strong medicine to an Indian, possibly related to his conception of the four winds, or the four corners of the earth. Comanche Jack, during the latter part of the past century, wore the cross on one of his shields to stand for the Great Spirit itself. The device also appeared as potent symbols on "ghost shirts" worn in battle, to protect wearers from enemy weapons. Placed on a "mantle of invisibility," the cross was supposed to give its wearer the magic power to walk unseen among his enemies.

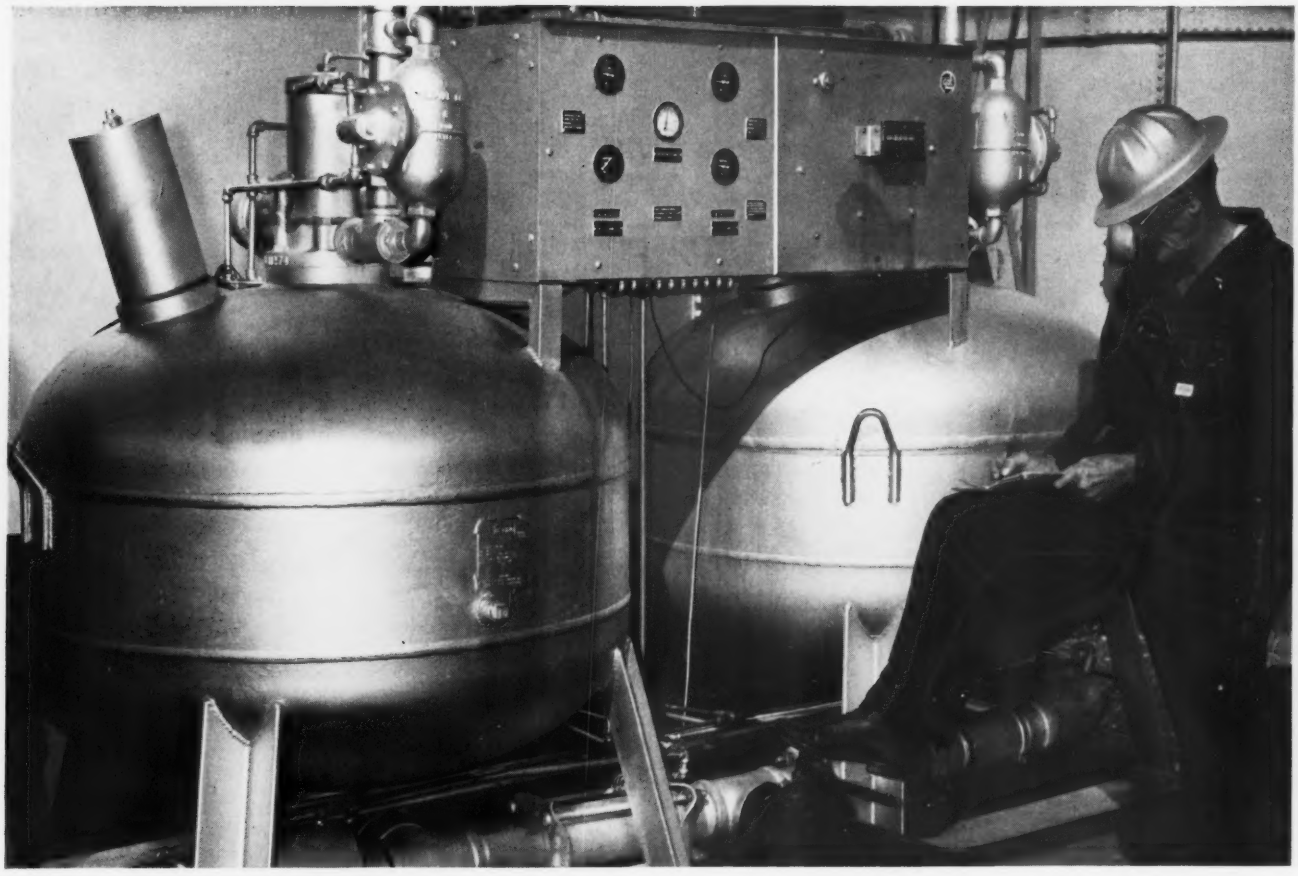
Lehmann, again, sheds light on the equal-armed cross and on four as a magic number. According to a legend in his tribe, the Great Spirit took earth from each of the four corners of the world to make man. This made it possible for a slain warrior to be buried where he fell; any place on earth would have to receive him because he had been made partly from its dust.

Paint Rock's most interesting pictograph is one so well preserved and so artistically drawn that it puts many a modern designer to shame. What it means is anybody's guess, but a Cherokee squaw who visited the place long ago gave a fanciful, if rather unlikely, account. According to her Comanche friends, she said, the picture tells of a division of lands made among the tribes, after long arguments around the council fires. Projections from a device centered in the main painting stand for the tribes at litigation, she said. Sawtoothed triangles at the top show that one tribe got the mountains; open spaces indicate plains assigned to another tribe. Lands awarded to other bands are shown as smaller parcels surrounding the bottom of the pictograph.

Paint Rock's most artistic pictograph. A fanciful interpretation of this piece says it tells of lands divided among the tribes long ago. See text, on this page, for additional details.

Interesting though the study of pictographs may be, it is indiscreet at best for the untrained to rush in where graybeard scholars fear to tread in translating them. Indeed, except to ethnologists and archaeologists, meanings are relatively unimportant. Beauty, as someone has said, lies in the eye of the beholder. This applies to ancient cliff paintings as readily as it does to designs on the kitchen linoleum, to a colorful landscape by Monet, or to the most recent of modernistic daubings. In any age or society, artists paint what they see around them, what shapes their lives, or what they believe in. In this, the Indian pictographer was no different from artists who came before him or those who came after. Though he had no written language, he had something to say and he said it as best he could.

No artist can do more.



Two kettle-like drums keep oil flowing non-stop from the Red Fish Reef oil field into the pipe line. The 5-barrel capacity measuring drums make the gauger's dip stick unneeded since all the information is recorded on dials, and gaugers simply have to read the numbers.

In the Red Fish Reef oil field, from producing wells into the pipeline . . .

OIL FLOWS NON-STOP

AN AUTOMATIC metering system for keeping a running record of oil flowing from producing wells into pipelines is proving its worth in the Red Fish Reef oil field in Galveston Bay.

The usual method is for oil to make a stopover in tanks where gaugers measure the oil before turning it into the pipeline. The new automatic metering operation, now used only at this one location, keeps crude oil flowing continuously from well gathering lines through the meters into the pipeline.

Basically, the Red Fish Reef system performs the same functions as the old system. Crude oil from gathering lines is routed through processing units which remove gas and salt water before the oil goes into a surge tank.

When the oil reaches a level of 13 feet inside the tank, an automatic control begins to pump it through the meters into the pipeline. Flow is continuous, and the volume of oil is recorded on a dial. To compensate for temperature changes, oil flowing through the meters is corrected to 60 degrees Fahrenheit, the standard temperature at which all crude oil is purchased.

One Humble petroleum engineer, who has seen the project grow from a drawing board idea to reality, pointed out some of the good features of the automatic system.

"First, the meters have proved to be highly accurate in measuring oil. Second, by maintaining a continuous flow from wells, we eliminate lease tank batteries and keep the amount of oil in lease storage to a bare minimum. Third, the paper work is substantially reduced."

Just how accurate are the meters? Since April, they have handled thousands of barrels of oil and have never been off more than one-tenth of one per cent. And, since they operate pneumatically from field gas, the system does not shut off when electrical power fails.

Even though the new system has proved itself, it cannot be expected to replace current equipment or methods completely for some time to come. It is, however, far beyond the experimental stage. And it illustrates that Humble searches relentlessly for better and more efficient ways of doing things.

RIGHT HOUSE...WRONG

ON A HOT day in August, 1866, two Texans solemnly fixed their signatures to one of the most interesting, but little-known, documents in the history of Texas oil.

This faded, hand-written paper (see facing page) may have some claim to fame as the greatest near-miss in an industry famed for near-misses.

Principals in the early-day drama were landowner Matthew Cartwright and prospector B. T. Kavanaugh. Kavanaugh, in particular, had fallen prey to the oil fever which swept the country ever since Colonel Edwin Drake drilled his famous discovery near Titusville, Pennsylvania, just seven years earlier.

If Pennsylvania could produce that much oil, Kavanaugh thought Texas could, too. In fact, he had his eye on a piece of land near the Gulf Coast town of Beaumont.

On one side of this property a curious mound swelled gently above the surrounding prairie like a plate turned upside down on a table. Kavanaugh wondered if Big Hill—as it was called—might not hold another Titusville—or even better!

THIS agreement made and entered into at San Augustine, Texas, this 12th day of August, A.D., 1866 by and between M. Cartwright of the first part and B. T. Kavanaugh of the second part, witnesseth,

That the party of the first part, for the consideration hereinafter expressed lease and doth hereby lease to the said party of the second part, the privilege of mining for Petroleum or rock oil, on a certain tract of land in Jefferson County, Texas, known as follows: The south half of headright survey of James W. Bullock containing 2214 acres—(less 1100 acres deeded to A. Houston). The said lease is given under the following terms and conditions. The said Kavanaugh is to go upon the land and prospect for oil. If he finds prospects sufficiently encouraging to justify burrowing he is to continue to enjoy the privilege until it is determined whether there is oil to be found there or not. If it is found in sufficient quantities to justify working, the lease is to continue for twenty years with the privilege of using all necessary timber and material for carrying on the oil business. If no oil is found then this lease expires and is thereafter to be null and void. Should oil be found and the well worked the said Cartwright is to receive one tenth part of the oil produced he furnishing the barrels for his portion, to be delivered at the well. The said Kavanaugh is to proceed without delay to explore the land and if satisfactory prospects are found he is to commence boring as soon as it is in his power to do so and to prosecute the boring until oil is found, or it is known that it cannot be found. The work is to be so conducted as to determine within two months whether this lease is to be continued or not.

In testimony whereof the parties have hereunto subscribed their names the date written above.

M. CARTWRIGHT
B. T. KAVANAUGH

G DOOR

With a little luck, and a lease farther south, Spindletop might have been discovered 35 years before its time

And there were plenty of grounds for his optimism. The whole place looked and smelled of oil. You could punch a stick into the soil and light a flame as gas escaped. Ponds and streams bore sour odors and gas bubbled eerily to water surfaces. Even the earth itself had a strange waxy feeling.

Kavanaugh was no man to sit idly by and let others beat him to the draw. If there were oil here, he wanted to be the first to find it. He soon leased a 1,114-acre plot from Matthew Cartwright and was, according to the agreement, to "go upon the land and prospect for oil."

No one knows if Kavanaugh actually drilled a well. All we are sure of is that he didn't find oil. That was reserved for later.

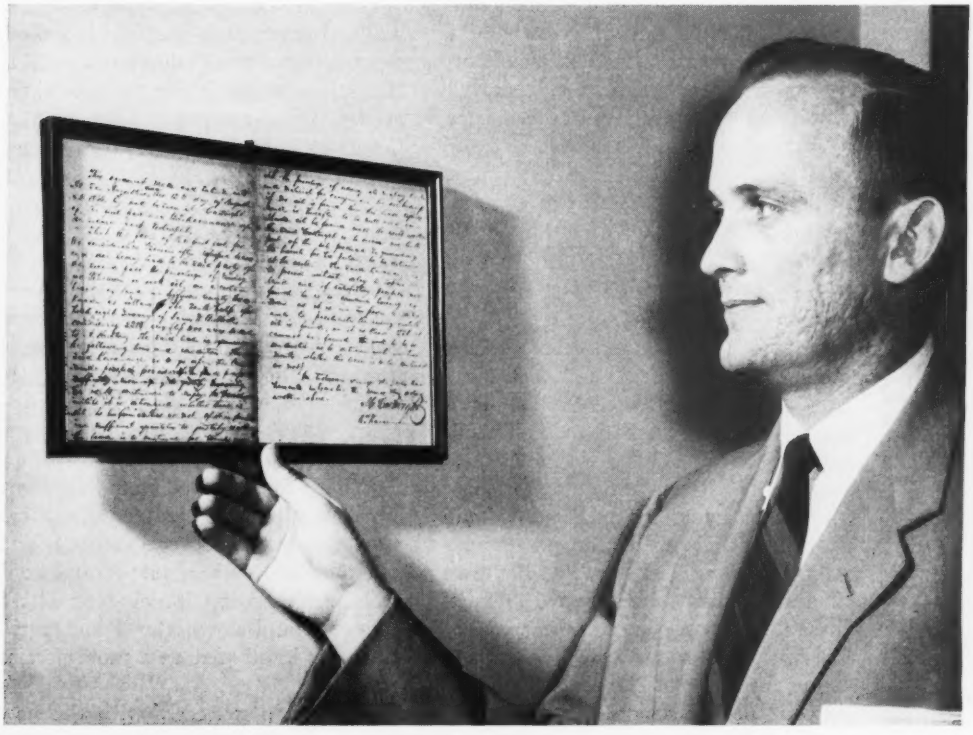
Thirty-five years after Cartwright and Kavanaugh penned their signatures, other leases were drawn up to drill on Big Hill. This time Patillo Higgins and Captain Anthony Lucas had the dream. Within eyesight of Kavanaugh's old lease on a cold day in January, 1901, Captain Lucas tapped an oil reservoir even more significant than Titusville. In one mighty roar, like a shot from a cannon, a 100-foot geyser of greenish-black liquid gushed over the top of the wooden derrick giving birth to the most famous oil field of history.

Spindletop—that early-day curiosity which beckoned Kavanaugh to its very portals—became the greatest oil discovery of the world up to that time.

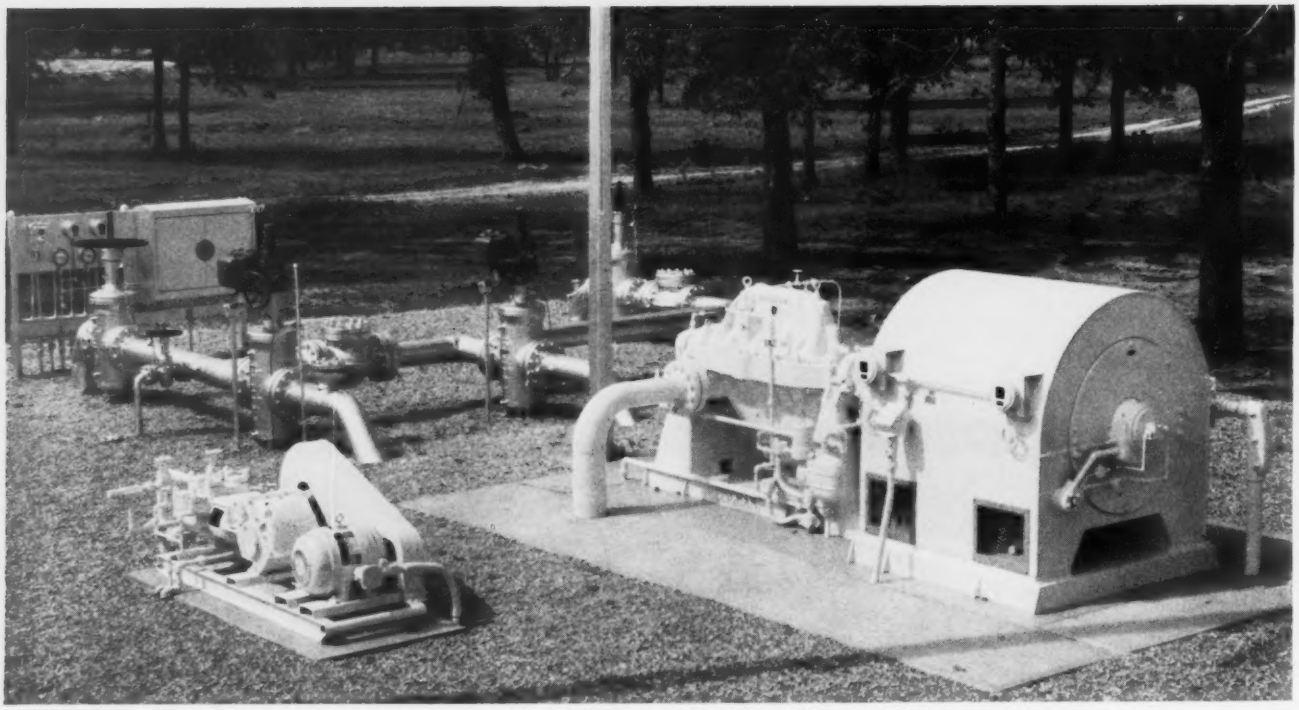
An acre of land on the hill soon was selling for as high as a quarter million dollars. Three wells were capable of flowing 185,000 barrels daily. The field could produce more oil in one day than all the rest of the fields of the world combined.

Oil, from that time forward, would become a necessity, an integral part of our daily lives.

P. S.: Kavanaugh never knew how close he came to discovering Spindletop. But Nature herself was against him. For his lease on the north flank of the field—was slightly beyond the productive limits of the salt dome even to this day. Any well there would have been a dry hole. In this early-day search for oil in Texas, pioneers Matthew Cartwright and B. T. Kavanaugh knocked at the right house, but on the wrong door.

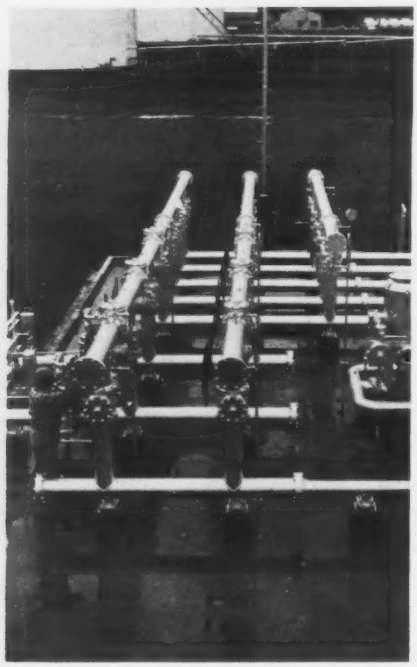


Owner of photostatic copy of old lease, the text of which is shown on opposite page, is Humble geologist George Sealy. His great, great grandfather, Matthew Cartwright, was one of document's signers.



Unmanned Navasota Pump Station is remote-controlled via electronics from panel board at Baytown Terminal more than 100 miles away. This new satellite unit has increased pumping capacity through Humble's product line from 25,000 to 30,000 barrels per day.

No one's home at



Baytown operator turns valve on manifold, readying pipeline for pumping operations.

ON A deserted slab of concrete near Navasota in Southeast Texas, a pipeline valve wheel suddenly begins to turn—slowly, as if moved by invisible hands. Then the silence of the countryside is broken by the whine of a big electrical pump as it whirs into action. Another valve wheel moves—also without apparent human effort—and a stream of liquid surges through the line on its way to distant destinations.

In this eerie manner, Humble Pipe Line Company's new unmanned Navasota Products Booster Station helps pump up to 30,000 barrels of oil products daily from Baytown to Central and North Texas terminals.

From start to finish, the only man who lifts a finger is an operator sitting before a panel board at Baytown Pump Station, more than 100 miles away. By simply pushing one button he opens and closes valves, starts and stops the pump at Navasota. One man does it all—by remote control.

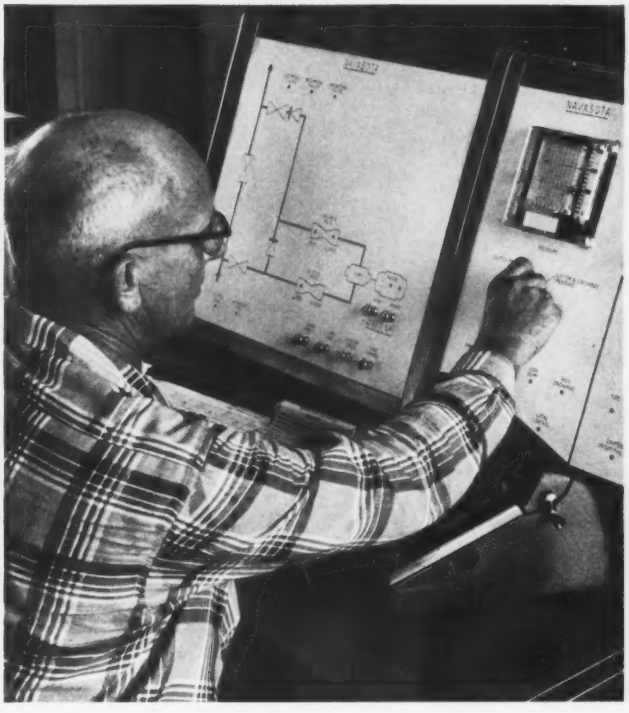
Logically enough, this system which makes telepumping possible is called *supervisory control*—shortened to SC. Humble is using it for the first time at the new Navasota Station on the Company's important Baytown-Irving Products Line.

An older products line booster station at Satsuma, a part of the larger Satsuma crude oil station, will be tied into the SC network soon. It will be controlled, along with Navasota, from Baytown. When in operation, both products line booster units will be deserted save for the electronic equipment, valves, and pumps sitting on the open concrete slabs.

What's to be gained from SC? Simply stated, it means greater efficiency. One man handles several stations. The operator in Baytown knows and controls exactly what is going on at all times up and down the line. Operations are integrated on a more precise timetable.

SC ties in perfectly with the new

A button is pushed by Baytown operator D. M. Routh, electrical pumps whir into action, and gasoline surges on its way northward.



Baytown control panel indicates operating pressures at Navasota. Gasoline has reached satellite station and is boosted on to Irving.

t Navasota

New satellite pump station means greater efficiency on Baytown-Irving Products Line

Navasota Station which was designed to increase the flow of Humble products from Baytown Refinery to the growing Central and North Texas marketing areas. It increases the efficiency of this flow and is partly responsible for raising the line's capacity from 25,000 to 30,000 barrels per day.

Although pipelining by remote control is new to Humble Pipe Line Company, Navasota Booster Station probably will graduate from the curiosity class before long. As one pipeline engineer pointed out: "Supervisory control is something that more and more pipeline people are turning to all along."

SC was bound to happen. It was inevitable in pipelining, an industry whose very life depends on efficiency. Now, it appears, Humble has begun to move from the pushbutton era to one where pushbuttons move pushbuttons.

No one knows what's next!

Quick phone call from Baytown summons aid to Navasota when an emergency arises.

Electrician journeys to Navasota, easily spots source of trouble from panel board.

At start of 10-day work period, Humble observer points out to electronic surveyor the offshore area in which they will work, the shot lines to be completed, and the number of shots per line. After being advised of over-all shooting procedure and area, the surveyor then will set up his equipment to guide boat to designated sites.

Surveyor busily checks instruments and maps as boat nears target area miles from shore. If vessel drifts off course, he quickly tells captain who makes correction. Operator keeps a tape recording of the radio wave lane count that can be checked later if a mistake is made. Each shot position also is recorded in case Humble should ever want to return and shoot the same spot again.

SEAFARING

On way to offshore location far out in the waters of the Gulf, Humble observer and electronic surveyor pause on ship's deck to discuss last minute details of survey and shooting schedule. Object in background is Galveston Lighthouse.

SURVEYING on dry land is tough enough at times. But when you set your sights on the restless waves in the Gulf of Mexico, the job can be doubly difficult.

Here are no highways, no signs, or other markers from which to take a bearing, and the shore line may be blotted out by curvature of the earth, fog, or rain. All you can see in every direction are rolling swells or choppy whitecaps.

Yet, despite these obstacles, seafaring surveyors these days in the Texas and Louisiana tidelands *are* spotting their targets miles offshore and *are* doing it with great accuracy even in the densest fogs and on the darkest nights.

Secret of their success lies in an electronic surveying technique. Via radio waves—not transits and tapes—they know at all times exactly where they are in the offshore waters and can readily and efficiently spot locations for Humble's seismic charges, gravity readings, or wildcat wells.

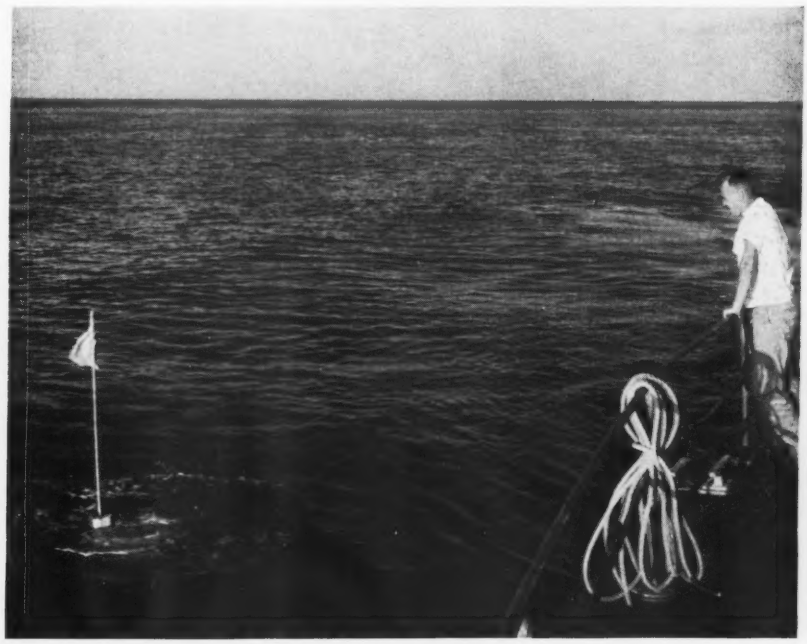
Fundamental to the operation are two or more radio transmitters on the shore line which beam special-type radio waves out to sea. These waves create a standardized, invisible pattern of intersecting lines that blanket the entire offshore area like the lines on a piece of graph paper. Electronic receiving sets on boats passing through this area see and identify these radio wave lines and indicate at all times the vessel's position in relation to them and the shore line.

In helping Humble with its offshore exploration and production work, electronic surveyors are proving that the "trackless sea" is perhaps not so trackless after all.

Radar-like scope on electronic surveying equipment is a "zero header"— used to help keep boat on a straight line while seismic shots are being pinpointed. Dials at upper left and right indicate to operator the vessel's exact position in relation to radio waves and shore line.

SURVEYORS

Geyser of water erupts into the air as 80-pound seismic shot explodes beneath surface of water. Electronic surveyors on lead boat set and record the location of each shot as the boats move down the seismic course line. Cable between two boats records the seismic reflections. Boats are now 40 to 50 miles from shore. Shot location is accurate to within 35 or 50 feet.



Bobbing buoy marks the end of one day's work and the beginning of another. Overnight markers with location readings on them are thrown over the side when shore transmitting stations go off the air—usually at 6 o'clock in the evening. Boat then pulls back and anchors down for the night. Next morning, shortly after sunrise, the buoy will be retrieved, a new course set, and the seafaring surveyors will be busy again spotting their offshore targets.

News Notes

New West Texas Pipeline Planned

Humble Pipe Line Company has announced plans for a major addition to its trunk system connecting the Texas Panhandle with the Gulf of Mexico.

Plans call for construction early in 1958 of a new 90-mile, 16-inch crude oil pipeline between Hawley Pump Station north of Abilene and Comyn Station south of Ranger.

The line will have a maximum capacity of 99,000 barrels a day and will eliminate the need for intermediate booster stations between Hawley and Comyn. It will replace the present 10-inch system between these two stations, which has a maximum capacity of 62,000 barrels a day.

Survey work already is under way and construction is expected to start in February. Total cost of the project is estimated at approximately $3,500,000.

The line will connect out of Comyn with facilities of other companies and with Humble's own multiple-line system which extends to Satsuma and Baytown by way of Hearne.

When construction is completed, the present 10-inch line will be taken up for use elsewhere. The three booster stations on the old line—at Clyde, Putnam, and Gorman—also will be dismantled, but there will continue to be an injection point at Clyde.

Another phase of the new pipeline project will be to convert Hawley from a diesel-engine station to an electric-motor, centrifugal-pump station.

Stamper Named Chief Civil Engineer

Harry Stamper

William Castille

Harry N. Stamper has been named chief civil engineer for Humble's Production Department, succeeding S. W. Oberg who retired after 38 years service, 29 of them as chief civil engineer.

William A. Castille, who was a division engineer in the Houston office, has been appointed assistant chief civil engineer, the position formerly held by Mr. Stamper.

The Production Department's new chief civil engineer went to work for the Company as an instrument man in the Boggy Creek Field near Jacksonville in 1927. In 1934 he was named division engineer in West Texas and three years later moved to the Houston office as construction engineer. A decade later he was named assistant chief civil engineer.

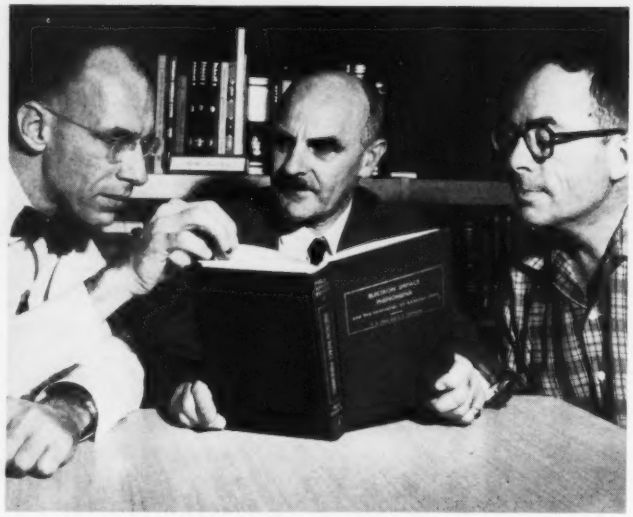
Mr. Castille is a native of Opelousas, Louisiana, and has been with Humble since graduating from LSU in 1936. In 1937 he was promoted to civil engineer and four years later became office civil engineer for the newly formed Louisiana Division.

Scientists-Authors Finance Scholarships

Two research scientists at Humble's Baytown Refinery who wrote a book on "Electron Impact Phenomena," have allocated the royalties to help finance scholarships for science students.

Frank H. Field and J. L. Franklin, the scientists-authors, have set up a trust fund of all royalties from the sale of their book. The fund will aid promising young science students toward college educations.

The book, which deals with the reactions that are observed when electrons of relatively low energy collide with atoms and molecules, has been selected by the publishers to be the first in a series of volumes under the general title, "Pure and Applied Physics."



Authors Field, left, and Franklin, right, look over their new book with H. S. W. Massey, professor of chemistry at the University of London, who is editor of the scientific series of which this book is the first.

Both authors have been engaged in basic research in the Baytown Research Center for several years. Field is a senior research chemist and Franklin is a research associate. Franklin is currently on loan to the U. S. Bureau of Standards in Washington, D.C., where he is engaged in studies related to the book's subject.

Dr. Fisk

Dr. Fisk Elected To Geological Council

Dr. Harold N. Fisk, chief of geologic research for Humble, was elected to the council of the Geological Society of America November 5 at the Society's 70th annual meeting in Atlantic City, N. J.

As a member of the GSA council, Dr. Fisk will share the responsibility of managing the property and affairs of the Society. He was elected for a three-year term.

Dr. Fisk has been with Humble since July, 1948, and helped organize the work of the newly formed Geologic Research Section in Humble's Exploration Department.

Defense Department Cites Humble

Maj. Gen. Meloy Mr. Ferguson

Humble has received a citation from the Department of Defense for "outstanding cooperation with the Reserve Program of the Armed Forces."

The award was accepted for Humble by H. W. Ferguson, vice president in charge of refining and sales. Major General Guy S. Meloy, Jr., deputy commanding general for reserve affairs, Fourth Army, made the presentation at a luncheon meeting of the Military Affairs Committee of the Houston Chamber of Commerce.

Humble was cited for its policies which encourage employees to participate in reserve activities and for its support of the Reserve Program through its Company publications.

Additional Contribution Announced

An additional contribution of approximately $6,450,000 to the Thrift Fund accounts of participants in the Humble Annuity and Thrift Plans has been announced by Humble Oil & Refining Company and Humble Pipe Line Company.

Employees participating in the Thrift Plans number approximately 18,000 or about 99 per cent of those who are eligible.

This contribution is in addition to regular contributions made by the Company during the year to supplement savings of employees who participate in the Annuity and Thrift Plans. These Plans, which became effective January 1, 1936, are a continuing part of Humble's employee relations program.

Employee participants in the Plans who retired during the 12-month period ending October 31, 1957, also will share in the additional contribution, as will participants who were on extended military leave during all or any part of the period.

Recent Retirements

HUMBLE PIPE LINE COMPANY

Name	Location	Date of Retirement	Years of Service
Ira C. Crownover	Ector District	Nov. 29	26
Julius B. Grupe	Longview Div. Office	Oct. 2	35
Fred C. Huddleston	Ector Station	Nov. 13	29
George N. Irvine	North Tex. Division	Sept. 28	37
August B. Later	Longview Station	Nov. 23	23
William Lowell	Harbor Island	Sept. 26	24
Francis F. Sneigr	Pierce Junction	Sept. 1	20

PRODUCTION DEPARTMENT

Durey L. Betts	Vernon District	Nov. 21	31
James W. Broom	Raccoon Bend	Oct. 1	36
Lawrence B. Duhon	Gulf Coast Div.	Nov. 26	31
Jacob G. Eipper	Vernon	Oct. 20	33
Oscar L. Fielder	Paradis	Sept. 16	30
John D. Fralick	Friendswood	Oct. 15	29
Jesse C. Hinson	Conroe	Nov. 13	32
William M. Howard	Eastern Div. Office	Oct. 31	25
Thomas L. McWilliams	Imogene	Nov. 20	28
James R. Price	Conroe	Oct. 25	36
Frank Thurman	Imogene	Nov. 5	35
Jeff Scott	London	Oct. 17	31

BAYTOWN REFINERY

Benjamin F. Barron	Docks Department	Oct. 14	31
Thomas J. Barron	Labor Department	Oct. 14	30
Willard H. Barber	Refining Operating	Nov. 18	37
Charles R. Cummings	Cracking & Polymerization Dept.	Nov. 1	31
Hosea H. Cutchen	Boiler Makers Dept.	Nov. 22	36
William R. Edgar	Electric Shop	Nov. 9	21
Grover K. Edge	Mechanical Dept.	Nov. 15	35
Sam P. Haltom	Cracking Coils	Sept. 30	31
August C. Kraft	Refining Operating	Oct. 1	38
Clyde H. Olive	Petroleum Phenol Plant	Nov. 9	32
Alberto Pantoja	Labor Department	Oct. 1	33
Lowell C. Wilburn	Paint Department	Nov. 1	34
Osburn L. Wilkinson	Boilermaker Dept.	Oct. 5	32
Emmitt C. Wood	Carpenters Department	Oct. 13	28

THE HOUSTON OFFICE

Wesley P. Ferguson	PL-Accounting	Nov. 22	33
Nils G. Guhlin	Exploration Dept.	Nov. 8	22

Deaths

Employees: Russell C. Barbour, Jr., 31, district petroleum engineer at Imogene, on October 7; Everett Bedford, 41, porter at the Houston Garage, on October 10; Marshall O. Fortenberry, 21, deckhand at Grand Isle, Louisiana, on September 20; Virgil Gonzales, 58, laborer-special at Baytown Refinery, on September 21; Walter B. Pankhurst, 53, lease pumpergauger at Hawkins, on October 24; Louis P. Podraza, 49, operator at Baytown Refinery, on November 2.

Annuitants: Lawson H. Bergeron, 82, former watchman at Baytown Refinery, on October 6; Luther W. Cornelius, 66, former senior tester at Baytown Refinery, on October 11; Frank M. Getzendaner, 81, former district geologist at Uvalde, on September 9; Will Hodges, Sr., 74, former laborer at Baytown Refinery, on September 30.

Frank A. Huwieler, 70, former accountant in the Houston Office, on September 27; Abe Kennard, 73, former porter at the Houston Bulk Station, on October 3; Alphus A. Michael, 53, former district clerk at London, on September 25, Robert A. John L. Mitchmore, 70, former oiler at Lytle Station, on September 11; George R. Samway, 71, former general foreman at Baytown Refinery, on October 10; Lee T. Shaw, Sr., 53, former district clerk at London, on September 25; Robert A. Webb, 81, former watchman at Baytown Refinery, on September 22; Andrew Whigham, 67, former electrician at Baytown Refinery, on October 22.

By the way

● A few weeks ago, when staff writer Will White said "Back to the salt mines!," he wasn't repeating an after-coffee cliche. He meant exactly what he said. For Will spent some time in self-exile 500 feet down in a Louisiana salt mine, gathering facts for his story on salt domes (pages 6-10).

What's it like down there? Big, for one thing. Miles of honeycomb passages run through the place, with plenty of room for trucks and machinery. Monstrous pillars of salt are left standing at intervals, to keep the roof from tumbling down.

Thirsting for adventure as well as information, White wanted to be on hand when the miners fired a salt-loosening blast. He wasn't disappointed, but he was a bit suprised when the shot went off. The shock wave felt for an instant like a giant vise trying to compress him. Even his clothes clung to him for a moment under pressure of the blast.

● In a science as resourceful as geophysics, antiquated techniques and tools are no oddity. Some are fascinating, though. A case in point: the European-made torsion balance, which found lots of Gulf Coast salt domes in the 20s and 30s before stepping aside for its offspring, the gravity meter.

B. A. Peterson, with the Z-beam Bamberg below, helped maintain Humble's first torsion balances. This one goes to Southwestern Louisiana Institute; others have been given to other schools and museums. Without ceremony, Humble retired the last of its 28 torsion balances in May, 1939.

B. A. Peterson and torsion balance.

● Before our writer in charge of Texana set out in July to study Indian pictographs at Paint Rock (pages 11-14), he took care to make his field trip a safe one.

He equipped himself for rock climbing and made ready for rattlesnakes, if any should dispute his passage. Friends in the Safety Division prescribed boots with non-skid soles. They issued a snakebite kit and briefed him on how to use it.

So, when he left, our writer was prepared for just about any trouble—except the kind that laid him low. Snakes? He didn't even see one. Slippery rock? He proved as nimble and sure-footed as a mountain goat. But he *wasn't* ready to romp around in West Texas' worst heat wave of the summer. After a few hours, he retreated and fought off a mild case of heat prostration. It was small solace to learn, that night, that the mercury had hit 105 at noon.

● George Sealy, Company geologist, told us he had a copy of an oil lease signed by his great-great-grandfather. Would we like to see it? We would. It turned out to be a lease dated 1866, involving land at Spindletop—and Spindletop wasn't discovered until 35 years later!

Here were the elements of an interesting story (pages 16-17). All we had to do was wrap the package. First, there was an intriguing link with Spindletop itself, whose discovery ushered in an age of liquid fuel. Second, Humble people know that operations at Spindletop attracted men who would join later in founding the Company. Third, the handwritten lease itself is a relic to excite attention.

● Mr. Ferguson's address, condensed on pages 3-5, was made in September before the Tenth Annual Health Conference for Business and Industry in Houston. The Humble Company won this year's award for contributions to industrial health.

The Humble Way

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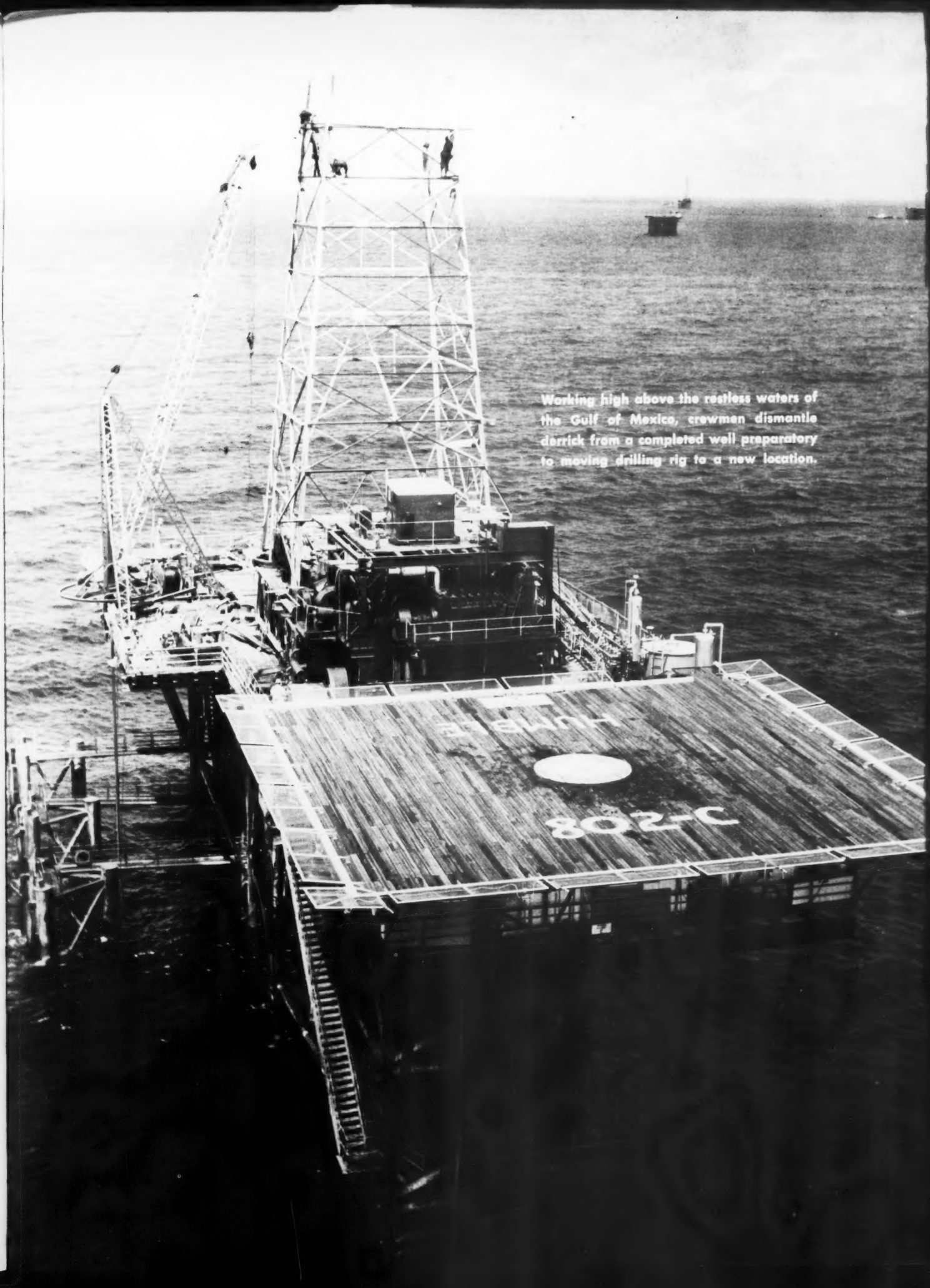
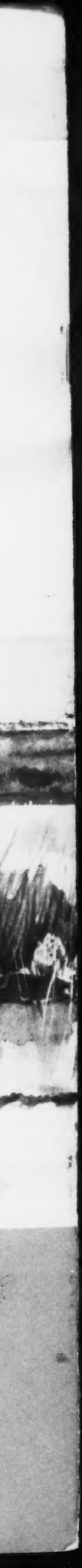
Working high above the restless waters of the Gulf of Mexico, crewmen dismantle derrick from a completed well preparatory to moving drilling rig to a new location.